

REMARKS

The Applicant has filed the present Response in reply to the outstanding Official Action of March 17, 2003, and the Applicant respectfully submits that the Response is fully responsive to the Official Action for reasons set forth below in detail.

In the Official Action, the Examiner rejected Claims 1-6 pursuant to 35 U.S.C. §103(a), as allegedly being unpatentable over Takita, *et al.* (U.S. Patent No. 6,151,005) (hereinafter "Takita") in view of Hayashi *et al.* (U.S. Patent 5,541,619) (hereinafter "Hayashi"). More specifically, the Examiner alleged that Takita is directed to a liquid-crystal panel in which an input and an output are configured with a buffer and correction circuits. Takita teaches a group of inverter circuits (3806) for inverting a display data, the inverted data generated (3807), a voltage selection (3712), selector elements (3804), switching elements (SWL), and a voltage divider circuit which is supplied with the output signal of the gate circuit. The Examiner also asserts that Takita also teaches a voltage divider circuit (Fig. 38), which selects a voltage corresponding to the display data and applies it to the liquid crystal display element (See Takita Col. 2, lines 8-11 and lines 54-61), and a gate circuit that corrects a signal corresponding to the display data. In addition, Takita teaches a selection of power source voltage, Vcc and Vss, by switching a select element. (4104). The Examiner admits that Takita does not teach the use of an inverter for inverting the digital image input signal. The Examiner suggests that Hayashi teaches this element. The Examiner contends that Hayashi teaches the signal generation means including alternating inverted signal outputting means for outputting an alternating inverted signal whose polarity is inverted every other frame.

Claims 1-6 have been cancelled herewith and new claims 7-8 have been presented for examination. New claims 7-8 do not contain new matter. In response to the above rejections, claims 7-8 are directed to a liquid crystal display comprising, *inter alia*, a liquid crystal panel being either normally white or normally black, a gradation power source supplying voltage depending on said liquid crystal panel, a liquid crystal display controller, which comprises: *an inverter for inverting a digital image input signal*; a selector for choosing and outputting a signal inverted by said inverter and said digital image input signal depending on a switching signal; a data processor for processing data for showing a signal transmitted by said selector on the liquid crystal display panel; and a liquid crystal driver for transmitting the digital image input signal data-processed to the liquid crystal panel using electric power supplied by the gradation power source, and a micro processor or a dual-in-line package switch outputting a switching signal for inputting the switching signal to the selector depending on the liquid crystal panel.

Takita does not disclose an inverter for inverting a digital image input signal. Furthermore, Takita selects and applies voltages corresponding to display data, while the claimed invention selects the display data for the type of liquid crystal panel, i.e., either the digital input image signal or the inverted signal. Therefore, the present invention differs from the teaching of Takita.

Hayashi discloses that a display apparatus displays an intermediate tone on a liquid panel by a data thinning-out system. The display apparatus comprises a signal generating means which comprises alternating inverted signal outputting means for outputting an alternating inverted signal whose polarity is inverted every other frame.

Furthermore, Hayashi discloses a data liquid crystal driver for applying to the data electrodes and a scanning liquid crystal driver for applying to the scanning electrodes. The liquid crystal display of the present invention does not comprise the above two structures of Hayashi. Further, the present invention provides a liquid crystal driving circuit which drives the normally white or normally black liquid crystal panel by inverting data using a liquid crystal display controller, a stark contrast to Hayashi's intermediate tone. Therefore, the present invention also completely differs from the invention of Hayashi.

Moreover, since the characteristics of the present invention are not disclosed or suggested in either reference, either alone or in any combination thereof, and because the present invention is in stark contrast to either prior art disclosure, one of ordinary skill in the art would not have been motivated to combine the references to obtain the present invention.

The inverted signal generation technique of Hayashi functions such that the mean value of effective voltages applied to respective pixels in a two adjacent tone representing cycles cancels each other out and become zero, so that no direct voltage is applied to the LCD panel. The positive portion of the signal and the negative (inverted) portion of the signal cancel each other out. In stark contrast, the claimed signal inverter is designed to invert a signal such that a digital image input signal or the inverted input signal (output of the inverter) can be selected depending on the mode of operation selected by the user, normally white mode and normal black mode, respectively. Therefore, one of ordinary skill in the art would not look to the inverted signal generation technique of Hayashi as an analogous inverter circuit.

In view of the foregoing, the Applicant believes that the above-identified application is in condition for allowance and henceforth respectfully solicits the allowance of the application.

Respectfully submitted,

  
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